

## CLAIMS

1. A promoter for ATP release from erythrocytes, comprising a substance which stabilizes the structure of hemoglobin in erythrocytes in the T-state.  
5
2. The promoter according to claim 1, wherein the substance which stabilizes the structure of hemoglobin in erythrocytes in the T-state is at least one selected from the group consisting of bezafibrate, nitric oxide, carbon dioxide and adenosine.
- 10 3. The promoter according to claim 1 or 2, which is capable of releasing ATP extracellularly under an oxygen partial pressure of 100 mmHg or less.
4. A pharmaceutical composition comprising a substance which stabilizes the structure of hemoglobin in erythrocytes in the T-state.  
15
5. The pharmaceutical composition according to claim 4, wherein the substance which stabilizes the structure of hemoglobin in erythrocytes in the T-state is at least one selected from the group consisting of bezafibrate, nitric oxide, carbon dioxide and adenosine.
- 20 6. The pharmaceutical composition according to claim 4 or 5, which is capable of releasing ATP extracellularly under an oxygen partial pressure of 100 mmHg or less.
7. The pharmaceutical composition according to any one of claims 4 to 6, which is a vasodilator or a blood flow improver.  
25
8. A method of releasing ATP from erythrocytes, comprising stabilizing the structure of hemoglobin in the erythrocytes in the T-state.
9. The method according to claim 8, wherein ATP is released under an oxygen partial  
30 pressure of 100 mmHg or less.
10. An inhibitor against ATP release from erythrocytes, comprising a substance which stabilizes the structure of hemoglobin in erythrocytes in the R-state.
- 35 11. The inhibitor according to claim 10, wherein the substance which stabilizes the structure

of hemoglobin in erythrocytes in the R-state is carbon monoxide or sulfonylurea.

12. The inhibitor according to claim 10 or 11, which is capable of inhibiting ATP release under an oxygen partial pressure of 100 mmHg or less.

5

13. A pharmaceutical composition comprising a substance which stabilizes the structure of hemoglobin in erythrocytes in the R-state.

10 14. The pharmaceutical composition according to claim 13, wherein the substance which stabilizes the structure of hemoglobin in erythrocytes in the R-state is carbon monoxide or sulfonylurea.

15. The pharmaceutical composition according to claim 13 or 14, which is capable of inhibiting ATP release under an oxygen partial pressure of 100 mmHg or less.

15

16. The pharmaceutical composition according to any one of claims 13 to 15, which is a vasoconstrictor or a blood flow regulator.

20 17. A method of inhibiting ATP release from erythrocytes, comprising stabilizing the structure of hemoglobin in the erythrocytes in the R-state.

18. The method of claim 17, wherein ATP release is inhibited under an oxygen partial pressure of 100 mmHg or less.

25 19. Erythrocytes in which the structure of hemoglobin is stabilized in the T-state.

20. The erythrocytes according to claim 19, which have been treated with at least one substance selected from the group consisting of bezafibrate, nitric oxide, carbon dioxide, adenosine and hydrogen ion.

30

21. The erythrocytes according to claim 19 or 20, which are capable of releasing ATP under an oxygen partial pressure of 100 mmHg or less.

22. Erythrocytes in which the structure of hemoglobin is stabilized in the R-state.

35

23. The erythrocytes according to claim 22, which have been treated with carbon monoxide or sulfonylurea.
24. The erythrocytes according to claim 22 or 23, which are capable of inhibiting ATP release  
5 under an oxygen partial pressure of 100 mmHg or less.
25. A pharmaceutical composition comprising the erythrocytes according to any one of claims 19 to 21.
- 10 26. The pharmaceutical composition according to claim 25, which is for treating ischemic diseases.
27. The pharmaceutical composition according to claim 26, wherein the ischemic disease is at least one selected from the group consisting of hemorrhagic shock, myocardial infarction,  
15 angina pectoris, cerebral infarction, intracerebral hemorrhage, obliterative arterial diseases, vascular disorders caused by diabetes, coronary artery stenosis, ischemic diseases of extremities, arteriosclerosis obliterans and ischemic ulcer/necrosis.
28. The pharmaceutical composition according to claim 26, wherein the ischemic disease is  
20 ischemia-reperfusion syndrome.
29. The pharmaceutical composition according to claim 28, wherein the ischemia-reperfusion syndrome results from at least one cause selected from the group consisting of post-shock resuscitation, perfusion after cold storage of organs, recanalization of blood flow after surgical  
25 operations, and reconstruction of obliterated blood vessels.
30. The pharmaceutical composition according to claim 25, which is for treating acidosis.
31. A pharmaceutical composition comprising the erythrocytes according to any one of  
30 claims 22 to 24.
32. The pharmaceutical composition according to claim 31, which is for treating vasodilatory diseases.
- 35 33. The pharmaceutical composition according to claim 32, wherein the vasodilatory disease

is septic shock or anaphylactic shock.

34. A method of measuring ATP, comprising quantitatively determining the amount of ATP released from erythrocytes in an oxygen concentration-dependent manner.

5

35. A method of enhancing ATP release from erythrocytes, comprising adding adenosine to an erythrocyte suspension and exposing the resultant suspension to a no oxygen or low oxygen partial pressure condition.

10 36. The method according to claim 35, wherein the no oxygen or low oxygen partial pressure condition is a condition where oxygen partial pressure is 0-150 mmHg.

15 37. A method of enhancing ATP release from erythrocytes, comprising adding adenosine to an erythrocyte suspension and exposing the resultant suspension to a carbon dioxide partial pressure of 60-80 mmHg.

38. The method according to any one of claims 35 to 37, wherein the concentration of adenosine is 0.1-10  $\mu\text{mol/L}$ .

20 39. A method of controlling ATP release from erythrocytes, comprising adding a substance that inhibits the anion permeation function of band 3 protein to an adenosine-added erythrocyte suspension.

25 40. The method of claim 39, wherein the substance that inhibits the anion permeation function of band 3 protein is sulfonylurea.

41. A controller for ATP release from erythrocytes, comprising a substance that inhibits the anion permeation function of band 3 protein.

30 42. The controller according to claim 41, wherein the substance that inhibits the anion permeation function of band 3 protein is sulfonylurea.

43. The controller according to claim 41 or 42, which is for inhibiting ATP release.